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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,968	06/24/2003	Hui Ou Yang	TSM03-0042	2018

43859 7590 07/22/2005

SLATER & MATSIL, L.L.P.
17950 PRESTON ROAD, SUITE 1000
DALLAS, TX 75252

EXAMINER

AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/602,968

Applicant(s)

YANG ET AL.

Examiner

Shamim Ahmed

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 and 7-12 is/are allowed.
- 6) ☒ Claim(s) 6, 13-21, 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. As regards to the 112, second paragraph rejection, the argument filed on 5/30/05 is not persuasive.

Applicants argue that the rejection is not proper because the term "etching" is clearly defined in the specification as applicant's own lexicographer.

In response to the argument, examiner acknowledged that applicants can be their own lexicographers but applicant's specification must clearly define the meaning of the terms.

It is noted that performing an etching process (removal of material) cannot be done by deposition process (the addition of material) as cited in claims 6 and 17.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 26 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In the claim, line 7, the use of the phrase "changing the thickness of a layer" does not have sufficient support in the specification, whereas, the specification only enables for specific process condition such as etching.

4. Claim 26 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for etching, does not reasonably provide enablement for "changing the thickness of a layer". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The specification recites very specific etching process (see at least paragraph 23), which makes the claim broader than the enabling disclosure.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 6 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claims 6 and 17, the phrase "etching includes one selected from the group consisting of : dry plasma etching; chemical vapor deposition; sputter-deposition; thermal deposition----- and physical vapor transport " renders the claim indefinite because it is unclear how an etching process can be a deposition process.

8. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 26, step c), recites the limitation "said dynamic etch progressions" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 13-21 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimbergen et al (6,712,927).

Grimbergen et al disclose an etching process of a multi-layer substrate, wherein a monitoring system monitors or determine the progress of a process being performed based on optical characteristics such as optical emission of individual layers to be etched relative to the underlayer by interferometry (col.7, lines 23-36 and col.13, lines 13-19).

Grimbergen et al do not explicitly teach providing a control algorithm or storing and storing or inputting the desired etch depths such as first and second target etch depth.

However, Grimbergen et al teach the etching process including a computer controller (155) including a computer program that operates the process chamber and one or more central processing units (col.11, lines 28-40).

Therefore, it would have been obvious to input or storing the target value into the computer program, which includes control algorithm.

Grimbergen et al teach that multiple layers being etched sequentially based on their etch rates (col.13, lines 13-19) and optical emission is measured for the layers by interferometry (col.7, lines 32-36).

Therefore, it would have been obvious the measured optical emissions are corresponding first and second etch rates for a particular layer and underlying layer as taught by Grimbergen et al.

13. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grimbergen et al (6,712,927) as applied to claims 13-21 and 23-24 above, and further in view of Applicant's admitted prior art.

Grimbergen et al discusses in the paragraph 12 above but remain silent about the determination of plurality of refractive indices each associated with the plurality of layers to be etched.

However, Applicant's admitted prior art teach that refractive indices are conventionally measured for the individual layer for precisely detecting the etch depth, wherein it may be assumed that the layer being etched with substantially uniform characteristics (see paragraph 0006).

Since, Grimbergen et al teach that multiple layers being etched sequentially based on the individual etch rates associated with the multiple layers (col.13, lines 13-19) and optical emission is measured for the layers by interferometry (col.7, lines 32-36).

Therefore, it would have been obvious to determine individual refractive indices associated with the multiple layers to be etched in order to provide a satisfactory prediction of the etched depth as suggested by Applicant's admitted prior art.

Allowable Subject Matter

14. Claims 1-5,7-12 are allowable over prior art.
15. Claim 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
16. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach a process including the step of calculating in real time the dynamic etch progressions based on the plurality of values such as optical characteristic associated with the plurality of layers undergoing said etching and

repeating the calculating and the determination steps until said target etch depth and said dynamic etch progressions are the same as the context of claim 1.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed
Primary Examiner
Art Unit 1765

SA
July 20, 2005